Statement of Work (SOW)

STATEMENT OF WORK FOR Procurement of RF Coaxial Switches

1.0 BACKGROUND

Radar Product Division, AML-2030, is procuring new RF coaxial switches for operating stock. The parts will be used for logistics support for 135 ASR-9 (Airport Surveillance Radar 9) Field Sites.

This Requirements Document describes the acquisition of RF coaxial switches, NSN 5930-01-310-1707.

1.1 CONTRACTING OFFICER'S TECHNICAL REPRESENTATIVE (COTR):

The Contractor Officer's Technical Representative (COTR) is formally designated this responsibility by the Contracting Officer to provide technical direction and Government oversight to the contractor on matters related to this contract.

2.0 SCOPE OF WORK

The vendor shall supply parts to the Federal Aviation Administration as outlined in the section below.

3.0 REQUIREMENTS

The vendor shall provide the RF coaxial switches in new condition. The switches must meet the specifications outlined in Westinghouse drawing 645A630. Below are the applicable part numbers for NSN 5930-01-310-1707.

<u>Part Number</u> 645A630H01	<u>Description</u> This is the source control part number originally used by the Westinghouse radar division, now owned by Northrop Grumman.
S-4111	This part number belongs to RLC Electronics. It is listed as an approved manufacturer's part number under drawing 645A630. They have been the source for these switches for at least the past ten years.
MS-3006	This part number belongs to K & L Microwave. It is listed as an approved manufacturer's part number under drawing 645A630. It is recommended that a first article be required since K & L Microwave has not manufactured these units for the FAA in the past ten years.

Other manufacturers are listed in drawing 645A630, but part numbers are not known. They have not been known to provide RF coaxial switches to the FAA in the past.

Drawings / Specifications
No. 645A630

	REVISIO	ONS	
LTR	DESCRIPTION	DATE	APPROVAL
J	See Rev PGE3C SH 1, 5 SH 12 Added	92-10-09	c.D.H.

SEE SHEET 12 FOR REVISION HISTORY

Unless otherwise specified dimensions are in inches DO NOT SCALE	
Tolerances Decimals Angles	SELECTED THEM DRAWING
2 places 3 places ± .005 ±	DRAWING TO BE CHANGED ONLY BY APPROVAL OF PARTS ENGINEERING
*LATEST	
DATE APPD 84/5/17 DRAWN BY AUTH C.Jones J-40373 CHKD PARTS ENGR D. D. Dunlap APPD APPD J.H.Blink P.Hightower DESIGN ACTIVITY APPROVAL	Baltimore, MD., U.S.A. 21203 FED. SUP. CLASS: 5930 SWITCH (COAXIAL) R.F. TRANSMISSION LINE SPOT
PROCURING ACTIVITY APPROVAL	SIZE CAGE CODE DWG, NO. A 97942 645A630 SCALE NONE WEIGHT SHEET 1 OF 12

WESTINGHOUSE	MANUFACTURER'S PART NUMBER				
PART NUMBER	RLC ELECTRONICS	DOW-KEY	AMPHENOL	MICROWAVE ASSOCIATES	K & L
645A630H01	S-4111	TO BE ASGN	TO BE ASGN	TO BE ASGN	MS-3006

APPROVED MANUFACTURERS	
NAME	CAGE CODE (H4/H8)
RLC ELECTRONICS	12598
DOM-KEA	00471
AMPHENOL	74868
MICROWAVE ASSOCIATES	96341
K & L MICROWAVE	50140

SIZE	CAGE CODE	DWG NO.
A	97942	645A630
SCALF:	NONE	.REV. B SHEET 2

1. SCOPE

This drawing delineates the requirements for a miniature spdt coaxial switch. Requirements which are specified herein but which are not specified or controlled in the manufacturer's published specifications are indicated by an asterisk(*).

APPLICABLE DOCUMENTS

The following documents of the issue in effect on the date of request for quote, form a part of this drawing to the extent specified herein. Documents listed without revision status shall be those in effect on the latest revision date of this document. (see 3.1)

Government and nationally recognized publications

QQ-P-35	PASSIVATION
QQ-A-200	ALUMINUM
QQ-S-571	SOLDER, LEAD TIN ALLOY
DOD-D-1000	ENGINEERING DRAWINGS
MIL-S-3928	COAXIAL SWITCHES
MIL-F-14072	FINISHES FOR GROUND ELECTRONIC EQUIPMENT
MIL-C-24308	CONNECTORS
MIL-C-39012	CONNECTORS
MIL-STD-202	TEST METHODS
MIL-STD-454	STANDARDS FOR ELECTRICAL EQUIPMENT
H4/H8	COMMERCIAL AND GOVERNMENT ENTITY (CAGE) CATALOGING HANDBOOK

REQUIREMENTS.

Drawing precedence. This drawing takes precedence over documents referred to herein and shall be interpreted in accordance with DOD-D-1000. A later revision of any document listed in section 2 without a specific revision letter may be used if requirements of the later revision are not degraded below those specified in the earlier revision.

SIZE	CAGE CODE	DWG	NO.	
Α	97942		64	5A630
2011	410315	DEV	CHEET	
SCALE:	NONE	. REV. G	SHEET	3

- * 3.2 Electrical.
 - 3.2.1 <u>Isolation</u>. The isolation between connected ports and the open port shall be 80 dB (minimum) over a frequency range of DC to 4.0 GHz.
 - 3.2.2 <u>Switching time</u>. The switching time shall not exceed 20 milliseconds.
 - 3.2.3 <u>Nominal Impedance</u>. The part shall have a nominal impedance of 50 ohms.
 - 3.2.4 <u>Power Handling Capability</u>. The part shall handle without adverse effects 25 watts average.
 - 3.2.5 <u>Insertion loss</u>. The part shall have a maximum insertion loss of 0.2 dB over a frequency range of 2.5 GHz to 3.1 GHz.
 - 3.2.6 <u>Voltage Standing Wave Ratio</u>. The part shall have a maximum voltage standing wave ratio of 1.2:1 over a frequency range of 2.5 GHz to 3.1 GHz.
 - 3.2.7 Operating Conditions. The part (at 25C) shall operate at 15 VDC/350 mA maximum.
 - 3.2.8 <u>Life</u>. The part shall operate without adverse effects for a minimum duration of 1,000,000 cycles.
 - 1.2.9 Operating Mode. The part is designed for failsafe operation.
 - 1.2.10 <u>Switching Sequence</u>. The switching sequence for the part shall be break before make.
 - 3.2.11 Operating Curves. The part shall operate in accordance with the curves (VSWR vs. Frequency, Insertion Loss vs. Frequency, Isolation Loss vs. Frequency) illustrated in figure 3 of this drawing from DC to 4 GHz.
 - 3.2.12 Solid State Control. The switch shall be compatible with the EIA RS-422 differential balanced interface. The switch shall be equipped with a balanced TTL line receiver compatible with a balanced line driver similar to the AM-26LS31. An integral terminating resistor of 150 W must be included in the switch. See Figure 2A.

IZE	CAGE CODE	DWG NO.
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CALE:	NONE .	REV. G SHEET 4

3.2.13 <u>Power/Logic Connector</u>. A nine pin miniature male D connector shall be used for power supply and logic inputs. Pin out shall be as follows:

Pin No.	<u>Function</u>
1 6 7 8	+15 Vdc Power Ground Positive (+) logic input Negative (-) logic input

3.2.14 Switch Control. Logic control of switching shall be as follows:

PIN 7	PIN 8	RF CONN.
L	resident resident	J1-J2
Н		J3-J2

- 3.2.15 Pick-up Voltage. The maximum pick-up voltage shall be 10 volts dc.
- 3.2.16 <u>Drop-out Voltage</u>. The maximum drop-out voltage shall be 5 volts dc.
- 3.3 Mechanical.
- 3.3.1 <u>RF Connectors</u>. Female SMA Coaxial Connectors shall meet the mating requirements of MIL-C-39012 without damage.
- 3.3.2 <u>Multipin Connectors</u>. The multipin power/logic connector shall be in accordance with M24308/3-1. Lock posts for the connector shall be included. This connector is a miniature "D", 9 pin male connector. The lockposts shall be capable of withstanding a ten inch-pound torque without rotating or loosening.
- 3.3.3 Soldering.
 - a. Internal solder connections shall incorporate the use of high temperature solder in accordance with QQ-S-571, $S_B S_{\circ}$.
 - b. Soldering practices shall be in accordance with MIL-STD-454, requirement 5.
 - 3.3.4 <u>Configuration</u>. The part shall meet the dimensional requirements as illustrated in figure 1 of this drawing.
 - 3.3.5 <u>Schematics</u>. The internal circuitry of this part shall be as described in the schematic diagram of figure 2.

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A	97942	545A630
SCALE:	MAME	REV SHEET 5

- 3.4 Material.
- * 3.4.1 Body. The body shall be aluminum in accordance with QQ-A-200.
 - 3.4.2 <u>SMA Connector</u>. The SMA connector shall be constructed of corrosion resisting steel.
 - 3.5 Finish.
 - 3.5.1 <u>Cover and Body</u>. The finish of the cover shall be in accordance with MIL-F-14072.
 - 3.5.2 <u>SMA Connector</u>. The SMA connector shall be passivated in accordance with 00-P-35.
 - 3.6 <u>Environmental</u>.
 - 3.6.1 Operating Temperature. The part shall meet the requirements of 3.2 while in an ambient temperature range of -10C to +70C.
 - 3.6.2 <u>Storage Temperature</u>. After being exposed to the temperature range of -55C to +125C, the part shall meet the requirements of 3.2.
 - 3.6.3 <u>Altitude</u>. The part shall be in accordance with 3.2 while operating under conditions specified in paragraph 4.2.1 of this drawing.
 - 3.6.4 <u>Humidity</u>. The part shall be in accordance with 3.2 while operating under conditions specified in paragraph 4.2.2 of this drawing.
 - 3.6.5 <u>Vibration</u>. When tested in accordance with paragraph 4.2.4, the parts shall meet the requirements of this drawing.
- - 3.7.1 Part Identification.
 - a. Westinghouse H4/H8 CAGE Code followed by a dash (-) and the Westinghouse part number. Example: 97942-645A630H01.
 - b. The actual manufacturer's name, registered trademark or H4/H8 CAGE Code.
 - c. Date code. On parts which are returned by the manufacturer after rework or reinspection, the manufacturer shall mark a new date code prefixed by the letter "R" without removal of any prior marking.
 - d. Serial number.

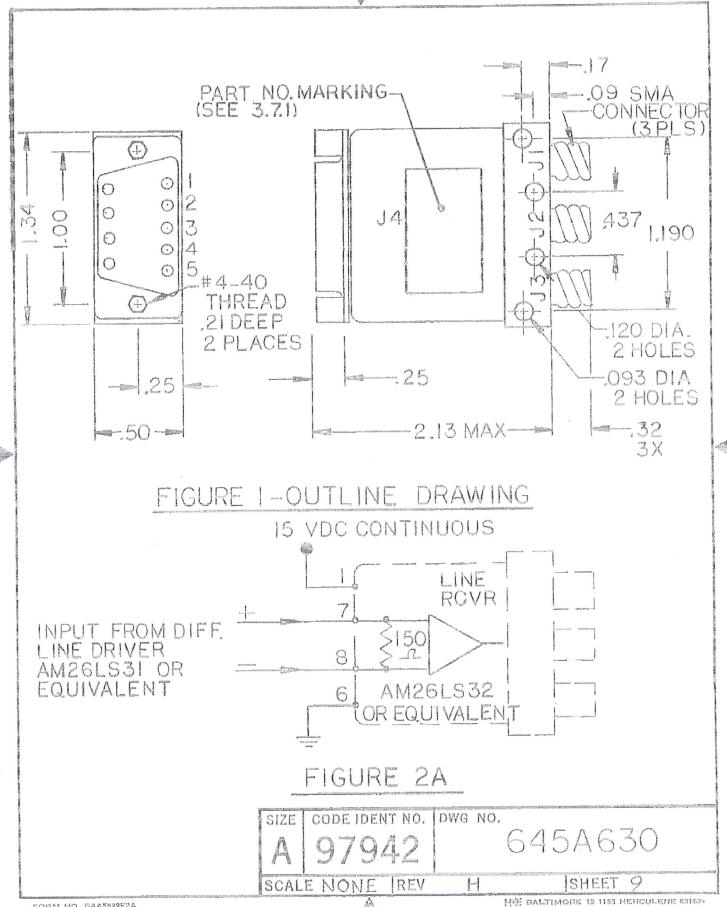
SIZE	CAGE CODE	DWG NO.
A	97942	645A630
SCALE:	NONE .	REV. 6 SHEET 6

- 3.7.2 <u>Additional marking.</u> The RF ports shall be identified as shown on the outline drawing.
- 3.8 <u>Marking Permanence</u>. All marking shall be clear and legible before, during and after unit is subjected to test as specified in paragraph 4.2.3.
- * 4. QUALITY ASSURANCE PROVISIONS
 - 4.1 Responsibility for inspection.
 - 4.1.1 <u>Manufacturer</u>. The manufacturer is responsible for controlling the quality of his product and offering to Westinghouse only those items that conform to all the requirements specified herein.
 - 4.1.2 <u>Westinghouse</u>. Westinghouse reserves the right to perform any test it deems necessary to assure that parts conform to all the specified requirements.
 - 4.2 Test Methods.
 - 4.2.1 <u>Altitude</u>. The part shall be tested in accordance with the requirements of MIL-S-3928 for altitude testing.
 - 4.2.2 <u>Humidity</u>. The part shall be tested in accordance with the requirements of MIL-S-3928 for humidity testing.
 - 4.2.3 Marking permanence. Parts shall be tested in accordance with MIL-STD-202, Method 215.
 - 4.2.4 <u>Vibration</u>. Testing shall be in accordance with MIL-S-3928, Method
 - 4.3 Quality Conformance Inspection. Quality Conformance inspection shall be performed in accordance with MIL-S-3928.
 - PREPARATION FOR DELIVERY
 - §.1 Preservation, packaging and packing. Preservation, packaging and packing shall be in accordance with MIL-P-23971, level C.
 - 5.2 Identification and marking
 - 5.2.1 <u>Unit package</u>. The unit package shall be marked with the following information:
 - a. Westinghouse H4/H8 CAGE Code (97942) followed by a dash and the Westinghouse part number. Example: 97942-645A630H01
 - b. The actual manufacturer's name, registered trademark or H4/H8 CAGE Code.

SIZE	CAGE CODE	DWG NO.
А	97942	645A630
SCALE:	NONE .	REV. G SHEET 7

- 5.2.2 <u>Shipping container.</u> The shipping container shall be marked with the following information:
 - a. Westinghouse part number
 - b. Manufacturer's name or registered trademark.
 - c. Purchase order number.
 - d. Month and year of preservation and packing.
- 6 NOTES (WESTINGHOUSE INTERNAL)
- 6.1 Approved sources. Identification of approved source(s) herein is not to be construed as a guarantee of present or continued availability as a source of supply for the item(s) described on this drawing.

SIZE	CAGE CODE	DWG NO.
A	97942	645A630
SCALE:	NONE	.REV. G SHEET 8



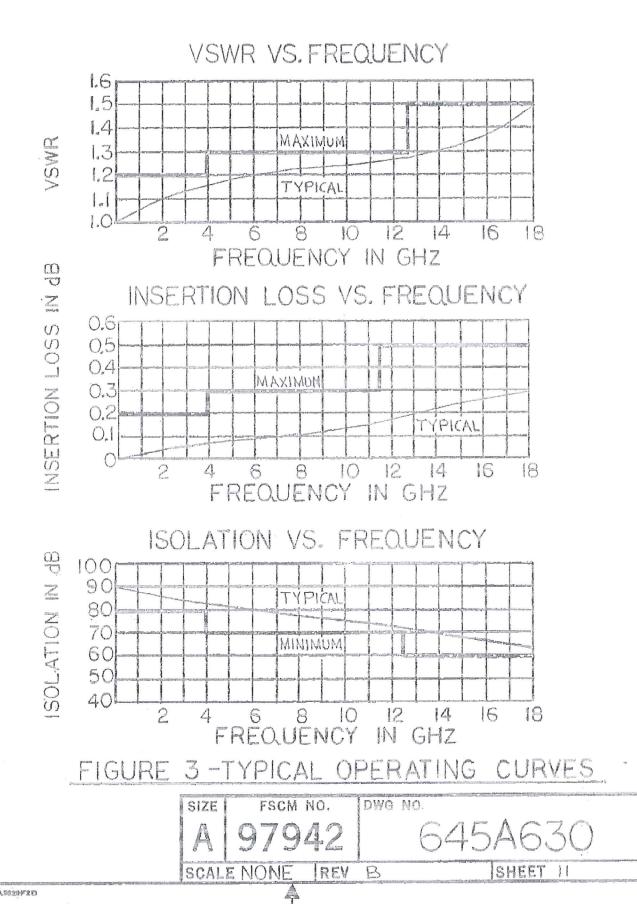
FAILSAFE CHTL CNTL BALANCED LINE TTL RECEIVER

FIGURE 2B-SCHEMATIC

FSCM NO. DWG NO. SIZE 645A630 SCALE NONE REV B 10 SHEET

FORM NO. BAA5829F2B

K&E BALTIMORE 19 1153 HERCULENE 1-79 MC9013:



FORM BAANSHFED

nije.

	REVISIONS		
LTR	DESCRIPTION	DATE	APPROVAL
H	See Rev PBG6C Replaces Rev G with change	91-02-12	CDH
	SH 1, 9		S. Carter

SIZE	CAGE CODE	DWG NO.
A	97942	645A630
		CHEET 10
SCALE:	NONE	REV. J SHEET 12

AC Form 4770-14

Preservation, Packaging, Packing, and Marking Requirements

Preservation, Packaging, Packing, and Marking Requirements

The requirements set forth in this form supersede any conditions inconsistent herewith. All specifications, standards, and

documents necessary to accomplish requirements herein will be of the issue in effect on the invitation for bids. Preservation and packaging shall be accomplished and coded IAW MIL-STD-2073-1 (DOD material procedures for development and application of puckaging requirements). The following items shall be preserved and packaged IAW coded requirements and related data shown below per MIL-STD-2073-1.

YSY:	59300	13101	70
------	-------	-------	----

PRES		CLEAN	PRES	WRAP	CUSH	CUSH	UNIT	INT	INT	PROT	OPT
METH	QUP	& DRY	MATER	MATER	& DUN	THICK	CONT	OTY	CONT	LEVEL.	IND
30)	1	1		11/	AD	ν.	F6			R	

Method of Preservation:

WATERPROOF OR WATERPROOF-GREATEPROOF PROTECTION WITH

PRESERVATIVE AS REQUIRED (SEE MIL-STD-2073-1E, SEE, MIL-STD-

2073-1F PAGE 15, PARAGRAPH 5.2 3.51

Onantity Unit Pack; ONE Clean & Dry Method: ANY SUITABLE PROCESS, UIAI ISSUIT (MAJEROUS TO THE FIEM

Preservation Material:

Wranping Material: MIL-PRF-22191 LYPE-III TRANSPAIENT WATERPROOF BARRIER -

MATERIAL

Cushion & Dunnage: CUSHION, ANCHOR, BLOCK OR BRACE AS REQUIRED.

Cushioning Thickness: AS RECUPED TO PROTECT THE ITEM OF FLEMENTS OF THE FACE AGE. Unit Container; VENDOR FIBERBOARD BOX.

Intermediate Quantity: NO REQUIREMENT IS SHECHED

NO REQUIREMENT IS SPECIFIED

Intermediate Container;

Level of Protection: PROTECTION TO MEET MODERAGE WORLDWIDES HIS MILL-STEP 2073, PAS

Special Packing Instructions:

Packing:

Unless otherwise indicated in the codes and other data reference above, packing and shiping containers will comply with MIL-8TD-2073-1 and/or specifications or institutions listed below

Level of Packing:

Marking:

All continues shift be marked IAW the requirements of MIL-81D-129 (Marking for Shaparus and Sterage)

Hasis Abriktman

(1-Material Breis: Number 12 Caze Code & Part Number 13-Description 14 Quantum & Unit of Issue 15,000 studies Contracts 1601, evel of Protective Date

Special Markings: DELICATE DOTHUMENT

Specifications type reference materials may be substituted with materials comparable to, or better than those specified at no increase in cost to the government.
AC Form 4770-14 File Reference: 11-007 Approved By:

First Article Test (FAT) Requirements

FIRST ARTICLE TEST (FAT) REQUIREMENTS

NSN	5930-01-310-1707

We, the undersigned, have determined that the use of first article testing is required. This decision was made only after considering the impact on cost, time of delivery, risk to the Government for foregoing such test, and the availability of other, less costly methods of ensuring the desired quality.

Signature Item Manager: Signature Engineer:						
1.a ENGINEER: (Print Name)	ROUTING SYME	BOL	DATE	PHONE NUMBER		
Anthony Nguyen	AML-2030		10/21/11	405-954-2652		
1.b ITEM MANAGER: (Print Name)	ROUTING SYME	BOL	DATE	PHONE NUMBER		
Sheri Crytzer	AML-2060		10/21/11	405-954-5697		
2. P/R NUMBER:	3. PART NUM	BER(S)	4. NSN			
8	645A630H01		5930-01-310-	1707		
5. Number of First Articles to be subject testing. (fill in quanti	6. OF LINE :	ITEM NUMBER		of Production Quantity		
2 each.			🛛 In a	l not be destroyed in testing) ddition to Production Quantity l be destroyed in testing)		
8. FIRST ARTICLE TESTING 🛛 WILL BE ((if Government testing, complete t						
BLOCK 9. FIRST ARTICLE GOVERNMENT TES	TING					
9a. GOVERNMENT TESTING of FIRST 9b. ARTICLE	FIRST ARTICLE		9c.WAI	VER of FAT Requirement		
⊠ Will be destroyed in test [] Will serve as to standard	he manufactur	ring	NO-FAT will not be waived		
☐ Will not be destroyed	Will not serve manufacturing s		_	YES-FAT can be waived if contractor has provided in the past. Engineer must approve.		
characteristics in order to be app	9d. FIRST ARTICLE GOVERNMENT TESTING. The First Article must meet or exceed the following performance or other characteristics in order to be approved.					
_d1	awing 645A630.					
Form, Fit and Function in accordan	ce with					
9e. FIRST ARTICLE DELIVERY		9f. SHIPPIN	G INSTRUCTION	ıs		
 First Article is due 90 Candate of contract. 	lendar days from		g instruction : (first art	is to Contractor		
		The state of the s	FAA LOGIST	CS CENTER		
Contractor shall notify Contrac (CO) 15 days before shipment.	ting Officer			15 - AML2000 cArthur Blvd.		
				ity, OK 73125 Shelby Nguyen		
			Production stock.	Units will go into operating		
3. Government has 30 Days aft First Article for test and revi		MARK FO	R: FIRST AR	TICLE/BID SAMPLE		
written notice of approval/disa Article. (usually 30 to 45 day	oproval of First	99300 900 , 9 80	Contract			
4. Estimated cost of Government		ATTENTI	ON: AMQ-	Ext.		
testing is	\$1000		Name:			
10. SPECIAL REQUIREMENT						
☐ Required		\boxtimes	Not Require	d		

"The first article offered must be manufactured at the facilities in which that item is to be procured under the contract, or if the first article is a component not manufactured by the contractor, such component must be manufactured at the facilities in which the component is to be produced for the contract. A certification to this effect must accompany each first article offered.						
11. DISPOSITION OF TEST SAMPLES	1					
 Each approved first article will be retained by the FAA and will be accepted as part of the contract production quantity. 						
oxtimes Each first article will undergo destructive testing; residual components $oxtimes$ will $oxtimes$ will not be returned to the contractor.						
Approved first article shall be returned to contractor and used as the production standard, first article shall be delivered as last production unit.						
Other:						
	_					

FIRST ARTICLE TEST REQUIREMENTS CONTRACTOR TESTING

BLO	BLOCK 9. FIRST ARTICLE CONTRACTOR TESTING (NOT APPLICABLE)						
9a.	a. Performance or other characteristics which First Articles must meet are: (provide list of test, procedures, data results required for approval)						
_							
-							
9b.	IF GOVERNMENT TESTING FIRST ARTICLE	9c. FIR	ST ARTICLE	18		9d.WAIVER of FAT Requirement	
	$\hfill \square$ Will be destroyed in test		Will serve as the	he manufactur	ring	☐ NO-FAT will not be waived	
	☐ Will not be destroyed		standard Will not serve a manufacturing s			YES-FAT can be waived if contractor has provided in the past. Engineer must approve. PLAN 1 ST DRAFT DUE For Engineering	
9e.	CONTRACTOR TEST PLAN REQUIRED)	9e.1 PLAN FO	RMAT	9e.2	PLAN 1 ST DRAFT DUE For Engineering review and comments.	
	Yes - See Block 9b.1 and complete Governm No - go to Block 9f Contrac				Days after award, with Days for Government Review, Contractor has Days after receipt of Government comment to submit final draft for approval or disapproval		
9e.	FIRST ARTICLE TESTING			9f. FIRST A	RTICLE	E TEST REPORT	
	1. First Article testing shall start Calendar days after award of the contract. 2. Contractor shall notify Contracting Officer (CO) 15 days before contractor to start testing. 3. First Article test report due 10 days after completion of First Article testing. 4. Government has days after receipt of First Article test report for review and issue written notice of approval/disapproval of First Article. (usually 10 to 15 days)				: FAA 650 P.O	cuctions to Contractor Contract Management Branch S. MacArthur Blvd. Box 25082 ahoma City, OK 73125-4929	
10.	SPECIAL REQUIREMENT						
	Requ	ired			Not	Required	
"The first article offered must be manufactured at the facilities in which that item is to be procured under the contract, or if the first article is a component not manufactured by the contractor, such component must be manufactured at the facilities in which the component is to be produced for the contract. A certification to this effect must accompany each first article offered.							
11.	DISPOSITION OF TEST SAMPLES						
	Each approved first articistandard delivered as last	le will : produc	be retained by tion unit(s).	the contracto	or and	will be accepted as production	
	☐ Each first article will up of the contract for referen	ndergo d ence if	estructive test required.	ing. Contrac	ctor s	hall keep residual until completion	
	Approved first article shabe delivered as the last p	all be r producti	eturned to cont on unit.	ractor but w	ill no	t be the production standard, it will	
	Other:						

Business Declaration

BUSINESS DECLARATION

1	Name of Firm:	Tax Identification No.:
2	Address of Firm:	DUNS No.:
3	a. Telephone Number of Firm:	b. Fax Number of Firm:
4	a. Name of Person Making Declaration	
	b. Telephone Number of Person Making Declaration	on
	c. Position Held in the Company	
5	Controlling Interest in Company ("X" all appropr	riate boxes)
	a. Black American b. Hispanic Ar	merican
	e. Other Minority (Specify)	f. Other (Specify)
	g. Female h. Male i. 8(a) Certifi	ied (Certification letter attached) j. Service Disabled Veteran Small Business
6	limited to financial and management decisions?	sible for day-to-day management and policy decision making, including but not the name and telephone number of the person who has this authority.)
7	Nature of Business (Specify all services/products (ALLICI)
7	(a) Years the firm has been in business	(b) No. of Employees
9	Type of Ownership: a. Sole Ownership	b. Partnership
	c. Other (Explain)	
10	Gross receipts of the firm for the last three years:	a.1. Year b.1. Gross Ending: Receipts
	a.2. Year b.2. Gross Ending: Receipts	a.3. Year b.3. Gross Ending: Receipts
11	Is the firm a small business? a. Yes	b. No
12	Is the firm a service disabled veteran owned small	business? a. Yes b. No
13	Is the firm a socially and economically disadvantag	ged small business? a. Yes b. No
I DE	ECLARE THAT THE FOREGOING STATEM	MENTS CONCERNING
ARE	E TRUE AND CORRECT TO THE BEST O	OF MY KNOWLEDGE, INFORMATION, AND BELIEF. I AM
AW_A	ARE THAT I AM SUBJECT TO CRIMINAL	PROSECUTION UNDER THE PROVISIONS OF 18 USCS 1001.
14. a Signa	a. ature	b. Date:
c. Ty Name		d. Title: